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## 60 Years

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From Friendship to Partnership



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# TABLE OF CONTENTS

<b>Title Page</b>	
<b>Foreword</b>	i
<b>Table of Contents</b>	ii
<b>INVITED SPEAKERS</b>	iii
Identifying the Customer in Vocational Education and Training (Andrew Williamson) .....	1
Partnership Models Of Vet And Industry: Germany Experiences In First And Continuous Education (Thomas Köhler) .....	6
<b>PARALLEL SPEAKERS</b>	
Industrial Support in Vocational Education and Training Development to Achieve Quality Assurance of Indonesian Professional Labor Force (M Thaufiq Pinat) .....	11
Designing New Concept of Internship in Vocational Education Curriculum: New Approach to Increase Alumni Assimilation In Workplaces (Dyah Darma Andayani, Vilia Darma Paramita) .....	19
Development Funding Model in the Implementation of Education in Vocational High Schools in the Field of the Construction Engineering Study Program (Machmud Sugandi) .....	23
Utilization of Quality Management System of ISO 9001:2000 in Electrical Engineering Education Department of Engineering Faculty of Yogyakarta State University (Sukir) .....	29
Principal Role in Strengthening the School Culture of Vocational High School (Nuryadin ER) .....	36
Redesign of Vocational Education in Indonesia as a Discourse in the Future (Badraningsih Lastariwati) .....	42
Students' Skills Competency Assessment Models on Vocational School (SMK) in Central Java (Aris Budiyo, Sugiyono, Pardjono) .....	48
Schlussfolgerungen für die Beraterqualifizierung an den Universitäten Nigerias (Moromoke Nimota Raji) .....	56
Spiritual Teaching Strategies to Reculture Student's Character in Vocational Secondary Schools (Istanto W Djatmiko) .....	60
Ethnic Minority Pupils in Indonesia Schools: Some Trends in Over-Representation of Minority Pupils in Special Educational Programmes at the Vocational (Soetyono Iskandar) .....	66
Graduates' Perception on the Graduate Competences of the Diploma III Vocational Education of Polytechnic (Ahmad Rifandi) .....	77
Entrepreneurship Incubator Increase Independence Students (Suranto, Rahmawati, Siti Nurlela, Sri Seventi) .....	85
Development of Integrated Task-Based English Language Learning Model (PBTT) for Vocational Technical School (Y. Gatot Sutapa Yuliana) .....	89
Problem Solving-Based Performance Assessment in the Learning of Consumer Education as a Means of Developing Critical-Thought Vocational Students Character (Sri Wening) .....	97
	iii

# UTILIZATION OF QUALITY MANAGEMENT SYSTEM OF ISO 9001:2000 IN ELECTRICAL ENGINEERING EDUCATION

## DEPARTMENT OF ENGINEERING FACULTY OF YOGYAKARTA STATE UNIVERSITY

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### Abstract

As the educational institution, Electrical Engineering Education Department of Engineering Faculty of Yogyakarta State University constantly improves its educational quality, such as by utilizing the Quality Management System (QMS) of ISO 9001: 2000. The problem brought into this paper: how was the utilization of QMS of ISO 9001 : 2000 implemented into the education process in this department especially the period of both 2009 and 2010 concerning to the programmed-quality target, implementation, obstacles, results and its impact? According the discussion on this paper can be concluded include as the following. Quality target in this department: (1) Improving the learning quality; (2) Improving the learning evaluation quality; (3) Improving the academic atmosphere quality; and (4) Improving the academic services quality. Implementation of quality target: (1) Founding team of target quality and developing of commitments; (2) Dissemination of target quality; (3) implementation of target quality on daily activities; (4) Controlling ISO recording documents; (5) ISO internal quality audit; and (6) ISO external quality audit. The main obstacles : (1) The need of sufficient funding; and (2) Commitment and self awareness by some lectures and staffs should be well-improved. The results of the implementation of quality target can classified as good category. Impact of implementing target quality: (1) This department has won the PHKI competitive grant; (2) Electrical Engineering Education Study Program was accredited A category; (3) Students of this department have won Indonesia Robot Championship as the 2<sup>nd</sup> winner in the Region of Central Java and Yogyakarta; and (4) Some graduates were approved to work in some bona fide company such as PT. Freeport Indonesia, PT. United Tractor and PT. Pertamina.

Keywords : utilization, quality management system, ISO 9001: 2000.

### 1. Introduction.

The nowadays global era is automatically bringing various consequences. The information flow which moves intensely and be supported by the development of sciences and technology presents to accelerate the globalization. World seems narrower, the limit among countries is so absurd, and the mobility among people from one country to another is now turning as a common style. An issue in one region would be easily informed to the people in around the world, shortly, all human in the world, slowly but sure would be grouped as the part of world society.

One of the consequences of globalization is the existing of free competition in all aspects of life. The competition of business opportunities, job seeking, art and craft, mastering of science and technology and so on, and no longer during local or national scope but international. The effortless people, who have no leading competences or people

who feel great locally, would be eliminated from this wild world stage slowly of fast. Only people with high quality of competencies will win and can keep playing their roles among the global era.

In creating the excellence and competitive human resources through the global era, participation in educational sector can be one of the keys. It is automatically that the educational institution must have an excellence quality as well. The educational institution with low quality would only be a sector that produces the low quality of human resources which have no leading competences. When they want to move forward and play a great role during the global era, so they need to improve the quality. Without those kind of development and effort, the educational institution would be ignored and be crushed by the globalization whirlpool.

Electrical Engineering Education  
Department of Engineering Faculty of Yogyakarta  
State University (EEED of EF of YSU) which is an

education institution that educate its student to be a teacher candidate for both Bachelor (S1) or Diploma (D3) has been continuously improving its quality of learning. The method in improving the quality is by using the Quality Management System (QMS) ISO 9001 : 2000 in their process of learning. Machine Engineering Education Department and Electrical Engineering Education Department, Engineering Faculty of Yogyakarta State University have achieve the acknowledgment by receiving the Certificate of ISO 9001 : 2000 in 2007 from Sucofindo International Certification Services (SICS). In 2008, another department of Engineering Faculty of Yogyakarta State University have also achieve the same acknowledgement from SICS. The problem brought into this paper is about how was the utilization of QMS ISO 9001 : 2000 implemented into the education process in EEED of EF of YSU especially the period of both 2009 and 2010 concerning to the programmed-Quality target, implementation, obstacles, results and its impact?

## 2. Discussion.

Few years ago, the educational world had be surprised by the industrial-based of educational maintenance model. According to reference [9], this model was an effort held by the educational institution managers in improving the educational quality based on the organization management known as Total Quality Education (TQE) which was developed from the concept of Total Quality Management (TQM). Philosophically, this concept emphasizes on the consistent searching toward the continuous improvement to achieve the costumer's needs and satisfaction.

Furthermore, reference [9] states that an institution which moves of services sectors, include the educational institution, must have a quality standard. An institution can be pronounced to have an excellent quality, in the concept of total quality management, must accomplish the established specification. Operationally, quality was determined by two factors, they were the quality in fact and quality in perception. The quality in fact was the accomplishment of specifications established previously. This quality standard was measured by criteria appropriate to specification, appropriate to purposes, zero defect and right first time every time. Quality in perceptions was the accomplishment of specification requested by the costumer's demands. The quality in perception can be measured by the costumer's satisfaction, interest and hope improvement.

There are some approach model which can be used in implementing the academic quality guarantee system in the educational institution, that is the approach of P-D-C-A, Kaizen approach, QMS ISO 9001 : 2001 approach and so on. QMS of

ISO 9001 : 2001 is a management system with the costumer's satisfaction approach. The costumer in this quality management system is internal costumer, external costumer and some part of importance. Reference [1] states that in order to apply the accomplishment of costumer satisfaction, there were eight basic principles, they were: (1) Costumer focus; (2) Leadership; (3) Involvement of People; (4) Process approach, (5) System approach to management; (6) Continual Improvement; (7) Factual-approach to decision making; and (8) Mutually beneficial supplier relationship.

According to reference [5], QMS of ISO 9001 : 2000 was a package of quality standard which helps an organization to identify, improve and prevent errors and to achieve the continuous improvement. Educational institution in all over the world apply the QMS of ISO 9001:2000 whenever they face the external forces to maintain their quality. According to Reference [8], the interest in applying the OMS of ISO 9001:2000 nowadays in the sector of education in Malaysia was classified as high, it was because the ISO standardization was viewed more objective. Also, EEED of EF of YSU utilize the QMS of ISO 9001:2000 into the learning process so that the education quality could be continuously improved.

### 2.1. Programmed-Quality Target in Utilization of QMS of ISO 9001:2000.

Reference [3] state that in order to apply the QMS of ISO 9001:2000 in university, an institution was needed to form the quality management to make sure that all activities and process of teaching-learning can meet the appointed-requirements. According reference [2], in the utilization of QMS of ISO 9001:2000 in university, the quality targets was needed to be well-planned. It was because this activity was such a big investment in both funding and time aspect. A good quality target was the key of implementation succeed. Through the quality target planning, a management system may coordinate the strategies and efforts, prepare the changes and maintain the improvement in order to facilitate and enhance the implementation of QMS of ISO 9001 : 2000.

The quality target of department in university is arranged according to vision, mission and department purposes. Quality target is made by the agreement through forum of lectures and staffs, especially in the process of education and learning in EEED of EF of YSU. According reference [4], the quality target especially in period of 2009 and 2010 are as follows:

#### 2.1.1. Improving the learning quality.

The quality target of improving the learning quality consist of some sub-activities, they were :

(1) The development of multimedia-based learning tools; (2) Improvement in utilizing the multimedia-based learning tools; (3) Improvement in utilizing the innovative learning strategy; (4) Improvement the quality of learning material; and (5) Development the e-learning-based learning.

#### **2.1.2. Improving the learning evaluation quality.**

This quality target consists of some sub activities : (1) Improvement of final exam quality; (2) Acceleration in submitting the exam score in final semester; (3) Implementation of remedial exam; and (4) Improvement of exam supervisor participation in the final exam of semester.

#### **2.1.3. Improving the academic atmosphere quality.**

This quality target consists of some sub activities : (1) Improvement of student attendance in the library; (2) Improvement of lectures and student attendance in class; (3) Improvement the number of lecture's publication; (4) Improvement the student participation in the scientific events and (5) Improvement of English accomplishment among the students.

#### **2.1.4. Improving the academic services quality.**

This quality target consists of some sub activities: (1) Acceleration of Industrial Practice counselor proposal accomplishment, final project and final task for students; (2) Improvement of services quality for student counselor by lectures of academic supervisor; (3) Improvement of library services for students and lectures; (4) Acceleration of college score accomplishment in the department; and (5) Services of coaching process in final project and final task for students.

### **2.2. The Implementation of Quality Target of QMS of ISO 9001 : 2000.**

In implementing the quality target of QMS of ISO 9001 : 2000, as programmed above, then the first step to do was by forming the team of quality target and building the commitment among the member of the team. This commitment was very important in order to build the QMS of ISO 9001 : 2000. The commitment of the quality target team need to be determined before any further action was taken to implement the quality target of QMS ISO 9001:2000. Without any clear and strong commitment from the team, the implementation of QMS of ISO 9001:2000 was relatively difficult to achieve well. The commitment of the team should be performed since beginning, and then be followed by behavior and attitude of the team consistently in applying the procedures of tasks.

Further, the programmed-quality target above needs to be socialized to all member of EEED of EF of YSU. This socialization was

importance to spread wide the quality target so that the commitment to implement the program can be optimally achieved. The socialization was held through meeting among lectures and staffs in the society of EEED of EF of YSU and by gluing the paper advertisement in the some appropriate places.

After being socialized, then the next step was to apply the quality targets into daily activities in EEED of EF of YSU by holding the principal of operational procedures determined in every programmed-quality targets. All member of team coordinate the role so that the quality target can be realized as their basic responsibilities.

In every quality target was completed by the procedures of record control so that all things relating to the quality goal can be well monitored, tracked in order to facilitate in taking any remedial action whenever the lack of procedure fulfillment was existing. Besides, the record controlling was aimed to give evidences of requirement compatibilities and the effective performance of quality targets. Record must be easy to read, ready to perform and easy to take. The procedures of record controlling consists also the identification, storage, protection, attempt, period of storage and record demolition. Records that become tool to present the effective operation must be formed, in order to fulfill the procedure of certification and costumer improvement whenever it is needed.

In the period of certain quality target implementation, it needs the internal quality audit toward the existing quality target performance. Internal audit was one of requirements which has to be fulfilled by EEED of EF of YSU to monitor the appropriateness and effectiveness toward the quality target implementation. The quality internal audit was held twice a year. The leader of team shall ensure the determination of effective and efficient internal audit process in order to access the strength and weakness of the quality target. The process of internal quality audit can be used as the management tool for the independent access of any process or activities appointed in the quality target. The process of internal quality audit was held by providing some tools in order to gather some objective evidences which show that all requirement have already been fulfilled. It was important for EEED of EF of YSU to ensure the improvement actions according to the internal quality audit result. The planning of internal quality audit should be flexible so that the emphasizing changes according to the objectives data and evidence can be possible to perform. The relevant input from the audited field, and other part with importance, should be wisely considered to improve the quality target in order to meet the external quality audit activities.

In certain period of quality target performance, the external audit was importance to bring about. This type of audit was generally performed once in two years. The implementation of quality target in EEED of EF of YSU has been audited twice, during 2007 and 2009. The external quality auditor comes from Sucofindo International Certification Services as 3 persons. During the audit, they perform the evaluation of quality target appropriateness which was programmed with the performance of quality target in the relating field. The result of the external audit was whether they find any inappropriateness of the quality target of either major or minor. Evidence could be major when they find any fatal mistakes of quality targets, and when it exists, the certificate which previously be given would be legally revoked. While the minor finding was when they find any light inappropriateness among the data and performances, and when it happens, they still may improve the quality of findings, so that the certificate still can be sustained.

### 2.3. Obstacles in Implementing Quality Targets of QMS of ISO 9001: 2000.

Although the implementation of quality targets of QMS of ISO 9001 : 2000 in EEED of EF of YSU is generally well-performed, but writer still can find any obstacles, relating to its performance. Those main obstacles during the implementation of QMS of ISO 9001:2000 in EEED of EF of YSU were as follows.

Firstly, to implement the quality targets of QMS of ISO 9001:2000, the sufficient funding was basically needed. While the ability of in EEED of EF of YSU gathering funds was limited. To handle this problem, then the management of EEED of EF of YSU has proposed the funding support to the faculty, and try to gather funds from production unit or other income generating.

Secondly, the commitment and self awareness among lectures and staffs still need to be improved in order to perform the QMS of ISO 9001:2000. To handle this obstacle, then the department management and team of quality target always try to perform any kind of personal approach toward lectures and staffs, so that the improvement of self awareness and commitment can be achieved.

### 2.4. The Implementation Result of Quality Targets of QMS of ISO 9001:2000

The quality targets of QMS of ISO 9001:2000 programmed in 2009 and 2010 has completely finished. According reference [6] and reference [7], the implementation result of quality targets of QMS of ISO 9001:2000 were as follows. The implementation result of quality targets

concerning to improving the learning quality are shown by Table 1. According to Table 1, it shows that all performance indicators in quality target of improving the learning quality, in both 2009 and 2010, all the planned targets could be achieved and completed, except the performance indicator of number of developed-learning material based on multimedia, which covers 100% of the target, while other are more than the targeted number. It automatically shows the improvement of lectures spirit in renewing the learning material in college. The quality target result concerning to improving the learning evaluation quality, will be shown as Table 2.

Table 1. The implementation result of quality target concerning to improving the learning quality.

Performance Indicator	Year 2009		Year 2010	
	Target	Achievement	Target	Achievement
The number of developed multimedia-based learning.	6 pcs	6 pcs	8 pcs	8 pcs
The number of lectures who utilize the multimedia-based learning.	6 persons	7 persons	8 persons	9 persons
The number of lectures who develop and utilize the strategy of innovative learning.	2 persons	3 persons	4 persons	6 persons
The number of improved-learning material in every semester	8 pcs	9 pcs	10 pcs	12 pcs
The number of subject that uses supplement through the e-learning-based learning.	2	3	4	6

According to Table 2, it shows that in both 2009 and 2010, all the performance indicator achievement can exceed the targeted performance indicators. The highest percentage of performance indicator achievement was the percentage of exam supervisor attendance in final exam of semester. It shows the higher lecture's awareness to fulfill their

responsibilities in supervising the semester final exam.

The result of quality target performance concerning to improving the academic atmosphere quality is shown by Table 3. According to Table 3, it shows that in both 2009 and 2010, all the performance indicator shows the above-target-achievement. On the performance indicator of lectures attendance frequency in class in a semester, there was an improvement of higher achievement in the end of 2010, that was 95%. Also, in the performance indicator of the number of publication by lectures, in fact in the end of 2010 it was extremely raising into 25 titles. It shows that lectures are more active in teaching and writing publication. In the other side, in the performance indicator of student attendance in library raises into the high achievement, that is in 2010, 250 students utilize the major library.

Table 2. The implementation result of quality target concerning to Improving the learning evaluation quality.

Performance Indicator	Year 2009		Year 2010	
	Target	Achievement	Target	Achievement
The number of student's violation in performing the final exam of semester.	10 persons	1 person	1 person	0
Time of final exam score submission.	2 weeks	1 week	1 week	1 week
The percentage of graduated-student in every semester	60%	75%	80%	80%
The percentage of graduated-student who has the remedial exam in every semester.	60%	75%	80%	80%
The percentage of supervisor attendance in final exam of semester.	80%	85%	90%	95%

On the performance indicator of TOEFL score or TOEFL like minimum for student, as the requirement to enter the final project or final task exam, it shows the high improvement among students, that was in the end of 2010 with the average of TOEFL is 430. From the explanation it shows that the quality of academic atmosphere in EEED of EF of YSU was pronounced as good.

The result of quality goal performance concerning to improving the academic services quality is shown by Table 4. According to the Table 4, it shows that in both 2009 and 2010, all the performance indicator can exceed the determined target. The highest improvement of achievement indicator of the number of session with the supervising lectures in one period of final project or final task classical accomplishment shows the high improvement, which in 2009 the achievement was 8 to 10 time, so therefore in 2010 it turns into 13 to 16 times. It shows that the quality of academic services in EEED of EF of YSU was good.

Table 3. The implementation result of quality target concerning to improving the academic atmosphere quality.

Performance Indicator	Year 2009		Year 2010	
	Target	Achievement	Target	Achievement
Frequency of student attendance in major library in a semester.	100 persons	150 persons	200 persons	250 persons
Frequency of lecture attendance in class in a semester	75%	85%	90%	95%
Number of lecture's publication in a year	10	15	20	25
Number of student who joins the scientific activity held by department.	10 persons	18 persons	20 persons	27 persons
The TOEFL score or TOEFL like minimum of student as the requirement to enter the final project or final task exam.	360	420	425	430

The result of performance indicator achievement as a whole, as shown by tables above, writer can find the synchronic value with the ISO external quality audit. The external quality audit was held by the assessor of Sucofindo International Certification in July 31<sup>st</sup> 2009, and the result was good and there was no major evidence existing during the audit. The external audit could only find 1 minor evidence, that the question from 2 subjects were not verified yet by using the absolute evidence paper. Then the management soon repairs the minor fault, and luckily it was then approved by assessor.

## 2.5. Impact of Quality Target of QMS of ISO 9001:2000.

The excellent result of quality target performance as mentioned above, in fact, cause some positive indirect impact to EEED of EF of YSU, they were as follows.

Table 4. The implementation result of quality target concerning to improving the academic services quality.

Performance Indicator	Year 2009		Year 2010	
	Target	Achievement	Target	Achievement
Length average of supervisor proposal accomplishment of Industrial Practice, Final Project, and final task for student.	3 days	2 days	2 days	1 day
Number of minimum frequency of student supervising services by the lecture of academic supervisor in a semester.	1	2	2	2
Number of the problematic student handled by the department and well-solved.	30 students	15 students	12 students	8 students
The number of meeting session with the supervising lectures in one period of final project or final	8-10	10-12	12-13	13-16

task classical accomplishment.				
Length of time need until the submission score of final project or final task issued by department.	21 days	17 days	12 days	7 days

Firstly, after the ISO external quality audit from Sucofindo International Certification in July 31<sup>st</sup> 2009, it was coincidentally that EEED of EF of YSU earned the visit from the assessor of Competitive Grant of PHKI of the National Education Ministry which then, in fact, giving the positive score to the Department, so that EEED of EF of YSU could achieve the Competitive Grant of PHKI for 3 years. Secondly, the visitation result of accreditation of the Study Program of Electrical Engineering Education of Engineering Faculty of Yogyakarta State University in 2010 shows the implementation of ISO quality target, so that the data needed by National Accreditation Body could be well accomplished, which result the study program to gain the accreditation of A. Thirdly, the student team of robot of EEED of EF of YSU in 2009 and 2010 succeed to gain the 2<sup>nd</sup> winner in the scope of Yogyakarta and Central Java regional for the Indonesian Robot Contest. Fourthly, in 2009 and 2010, some graduates are approved to work in some bona fide company such as PT. Freeport Indonesia, PT. United Tractor and Pertamina.

## 3. Conclusion.

According to the discussion of this paper, writer concludes that the utilization of QMS of ISO 9001:2000 into the educational process in Electrical Engineering Education Department of Engineering Faculty of Yogyakarta State University especially the period of 2009 and 2010 are mentioned as follows :

- 3.1. Quality target in this department: (1) Improving the learning quality; (2) Improving the learning evaluation quality; (3) Improving the academic atmosphere quality; and (4) Improving the academic services quality.
- 3.2. Implementation of quality target: (1) Founding team of target quality and developing of commitments; (2) Dissemination of target quality; (3) Implementation of target quality on daily activities; (4) Controlling ISO recording documents; (5) ISO internal quality audit; and (6) ISO external quality audit.
- 3.3. The main obstacles: (1) The need of sufficient funding; and (2) Commitment and self awareness by some lectures and staffs shall be well-improved.



- 3.4. The results of the implementation of quality targets could be classified as good category.
- 3.5. Impact of implementing target quality: (1) This department has won the PHKI competitive grant; (2) Electrical Engineering Education Study Program was accredited A category; (3) Students of this department have won Indonesia Robot Championship as the 2<sup>nd</sup> winner in the Region of Central Java and Yogyakarta; and (4) Some graduates are approved to work in some bona fide company such as PT. Freeport Indonesia, PT. United Tractor and Pertamina.

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**60 Years**  
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# Certificate



presented to

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in

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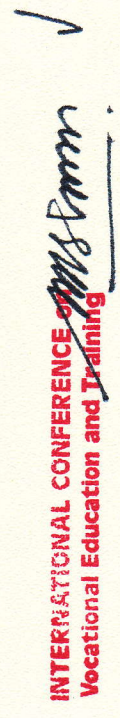
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